

Remarks/Arguments

Rejection of Claims 1-13 and 19 under 35 U.S.C. §103(a)

The Examiner rejected Claims 1-13 and 19 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,063,368 (Ettehadieh). Applicant respectfully traverses the rejection inasmuch as the rejection may apply to the claims as amended.

Claim 1

The four magnets of Ettehadieh are not analogous to the magnet recited in Claim 1

In the Advisory Action of September 9, 2005, the Examiner stated that Claim 1 employs language indicating “at least one magnet” and that Ettehadieh meets this limitation. Ettehadieh teaches, suggests, and motivates four magnets along a fuel line. On page 4 of the February 28, 2005 Office Action (hereinafter referred to as the Office Action), the Examiner stated: “With respect to claim 1, the magnet can be interpreted to comprise four magnets 14 acting as a single magnet (see Figure 3).”

A. Examiner has not provided evidentiary evidence

The Examiner postulates that four magnets 14 act as a single magnet. However, the Examiner has provided no substantiation for this theory. In fact, Applicant shows *infra* that this is clearly not the case. Assuming that the Examiner is relying on scientific theory, the Examiner must provide evidentiary evidence. “However, when an examiner relies on a scientific theory, evidentiary evidence for the existence and meaning of that theory must be provided.” *In re Grose*, 592 F.2d 1161, 201 USPQ 57 (CCPA 1979).

B. Magnets 14 have different structure and function than a single magnet

The four magnets of Ettehadieh have a completely different structure than a single magnet. A first overarching problem with the arrangement of magnets 14 is that like polarities are shown in direct contact with each other, which is completely contrary to well-established practice in the field of magnets and magnetism. To illustrate this point, Applicant has attached Appendix A, which is a sketch of magnets 14 in Figures 7 and 8 of Ettehadieh. In Appendix A, the respective poles have been clearly designated to facilitate this discussion. For example, col. 3, lines 50-54 of Ettehadieh state that the south poles of magnets 14 are facing the fuel line.

Looking at magnets 14A-14D in Appendix A, respective north and south poles for magnets 14A and 14B and 14C and 14D, respectively are in direct contact. It is well known that like magnetic poles repel each other, as shown on page 3 of Appendix B (an excerpt from www.school-for-champions.com). Therefore, there will be a relatively large force pushing the magnets apart. Hence, the composite structure of Ettehadieh is completely unstable and cannot maintain the configuration shown in Figures 7 and 8 without the application of large outside forces and restraining mechanisms. That is, a restraining mechanism is an absolutely necessary part of the structure of magnets 14. Such a restraining mechanism is irrelevant to a single magnet. Thus, there is no structural similarity between magnets 14 and a single magnet.

To overcome the forces of repulsion, Ettehadieh would need to apply a very large amount of force to push the magnets together and would then require a very strong structure, restraining the magnets in all directions, to maintain the magnets in such this extremely unstable arrangement. Assuming *arguendo* that Ettehadieh did teach this force and structure, this arrangement of four mutually repulsing magnets, initially pushed together by outside force, and maintained in an inherently unstable configuration by additional restraining means is clearly not analogous to a single magnet.

Magnets 14 would not function like a single magnet either. That is, magnets 14 would not create a magnetic field anything like that for a single magnet. Page 1 of Appendix B shows field lines for a single magnet. Page 3 of Appendix B shows field lines for one pair of magnets, having only set of poles in opposition (north in this case). Even with only one pair of poles in opposition on page 3, the field lines on pages 1 and 3 are completely dissimilar. Opposing both poles of the magnets shown on page 3 and then adding a second pair of similarly configured magnets, as is the case for magnets 14, would only acerbate the difference.

Assuming *arguendo* that the fields shown by Ettehadieh are correct, which they are not, Ettehadieh would require that a precise configuration be obtained and maintained to prevent distortion of the fields, which is not necessary or cogent with respect to a single magnet. Magnets 14 require extra steps and materials in the manufacturing/assembly process. Magnets

14 are susceptible to negative influences that are nonapplicable to a single magnet, for example, the problem of contamination entering the housing and getting between the magnets 14.

C. Ettehadieh is not operable

As noted *supra*, Ettehadieh's arrangement is not operable in general. That is, it is contrary to sound principles in the field of magnetism to attempt to form a plurality of separate magnets into a configuration in which like poles are touching. Further, Ettehadieh fails to teach how he would even attempt to construct and maintain this configuration of magnets 14. For example, in Figures 7 and 8, Ettehadieh does not show the restraining mechanism that would be necessary to hold magnets 14 in contact and overcome the forces of repulsion that would push the magnets apart as described *supra*. In other words, Figures 7 and 8 are inoperable. Figure 3 of Ettehadieh shows magnets 14 in a housing, but there is no teaching of how the magnets were forced into the housing or the level of structural integrity that would be needed to maintain the unstable configuration shown.

Ettehadieh teaches that magnets 14 create a field akin to the field shown on page 2 of Appendix B and the manipulation of this field is the basis of his invention. However, as shown *supra*, magnets 14 clearly do not form the organized fields shown on pages 1 and 2 of Appendix B. "When the reference relied on expressly anticipates or makes obvious all of the elements of the claimed invention, the reference is presumed to be operable. Once such a reference is found, the burden is on applicant to provide facts rebutting the presumption of operability." *In re Sasse*, 629 F.2d 675, 207 USPQ 107 (CCPA 1980). Applicant has clearly demonstrated that the arrangement of Ettehadieh is not operable.

D. Ettehadieh is contrary to sound scientific principle

As shown *supra*, Ettehadieh's configuration for magnets 14 flies in the face of sound scientific principle. That is, it is contrary to sound principles in the field of magnetism to attempt to form a plurality of separate magnets into a configuration in which like poles are touching.

"The rationale to support a rejection under 35 U.S.C. 103 may rely on logic and sound scientific principle." *In re Soli*, 317 F.2d 941, 137 USPQ 797 (CCPA 1963). Applicant has

clearly demonstrated that the arrangement of Ettehadieh is illogical and contrary to sound scientific principles regarding magnetism.

“There are three requirements to establish a *prima facie* case of obviousness: there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; there must be a reasonable expectation of success; and, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1483 (Fed. Cir. 1991).” For all the reasons stated above, Ettehadieh does not teach, suggest, or motivate the at least one magnet recited in Claim 1. Therefore, Ettehadieh fails to meet the first and third *prima facie* requirements noted above.

Regarding the second requirement, there can be no expectation of success, since as shown *supra*, Ettehadieh’s arrangement is inoperable and contrary to scientific principle.

Ettehadieh cannot be used to teach, suggest, or motivate a metal plate

Amended Claim 1 recites: “at least one metal plate disposed on an upper side of said magnet;” Applicant has shown *supra* that Ettehadieh fails to teach, suggest, or motivate the at least one magnet recited in Claim 1. Applicant also has shown that Ettehadieh is inoperable and contrary to logic and sound scientific principle, and therefore, cannot be used as a primary reference in an obviousness rejection. Therefore, Ettehadieh cannot be used to supply any teachings regarding a metal plate on a single magnet.

For all the reasons noted above, Claim 1 is patentable over Ettehadieh. Claims 2-13 and 19, dependent from Claim 1, enjoy the same distinction from the cited reference. Applicant courteously requests that the rejections be removed.

Rejection of Claims 14-18 under 35 U.S.C. §103(a)

The Examiner rejected Claims 14-18 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,063,368 (Ettehadieh) in view of U.S. Patent No. 5,271,369 (Melendrez). Applicant respectfully traverses the rejection.

Claim 14

Claim 14 is patentable over Ettehadieh

The Examiner stated that Ettehadieh teaches all the limitations of Claim 14 except a shield, focusing bar, and second magnet assembly and plate. Claim 14 recites: "said first double magnet assembly comprising: a first magnet having a lower side centrally disposed adjacent a longitudinal portion of the fuel line to provide a magnetic field proximate said fuel line; a second magnet disposed on top of said first magnet in magnetic attraction therewith at least one metal plate disposed near an upper side of said second magnet; and, at least one shield substantially surrounding said first and second magnets, said at least one metal plate and said longitudinal portion of said fuel line; said shield defining a cavity for receiving said first and second magnets and said metal plate." That is, the Examiner stated that Ettehadieh teaches every element of Claim 14 except those underlined above.

The four magnets of Ettehadieh are not analogous to the two magnets recited in Claim 14

It is well-known in the art that a pair of magnets configured as shown in Figures 7-9 of the present application form a stable configuration (the magnets are held together by the forces of mutual attraction without the need for a retraining structure) and that the resulting field lines are similar to that of a single magnet (see pages 1 and 2 of Appendix B). Thus, for purposes of comparison to Ettehadieh, the single magnet of Claim 1 and the two magnets of Claim 14 can be considered analogous. Applicant makes no statement that the single magnet of Claim 1 and the two magnets of Claim 14 are analogous outside of this comparison. Applicant has shown *supra* that magnets 14 are not analogous to a single magnet. The same arguments apply to magnets 14 and the two magnets of Claim 14 and for the sake of brevity are not repeated here. That is, magnets 14 are not analogous to the double magnets of Claim 14.

Melendrez does not cure the defects of Ettehadieh

The arguments regarding Ettehadieh and a metal plate presented *supra* for Claim 1 are applicable to Claim 14. Melendrez does not cure the defects of Ettehadieh, since Melendrez contains no teaching, suggestion, or motivation regarding "at least one metal plate disposed near an upper side of said second magnet"

For all the reasons provided above, Claim 14 is patentable over Ettehadieh and Melendrez. Claims 15-17, dependent from Claim 14, enjoy the same distinction from the cited references. Applicant courteously requests that the rejections be removed.

Claim 18

Applicant has shown that Claim 1 is patentable over Ettehadieh. Melendrez fails to cure the defects of Ettehadieh regarding Claim 1. Therefore, Claim 1 is patentable over Ettehadieh and Melendrez. Claim 18, dependent from Claim 1, enjoys the same distinction with respect to the cited references. Applicant courteously requests that the rejection be removed.

Conclusion

Applicant respectfully submits that all pending claims are now in condition for allowance, which action is courteously requested.

Respectfully submitted,



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CPM/

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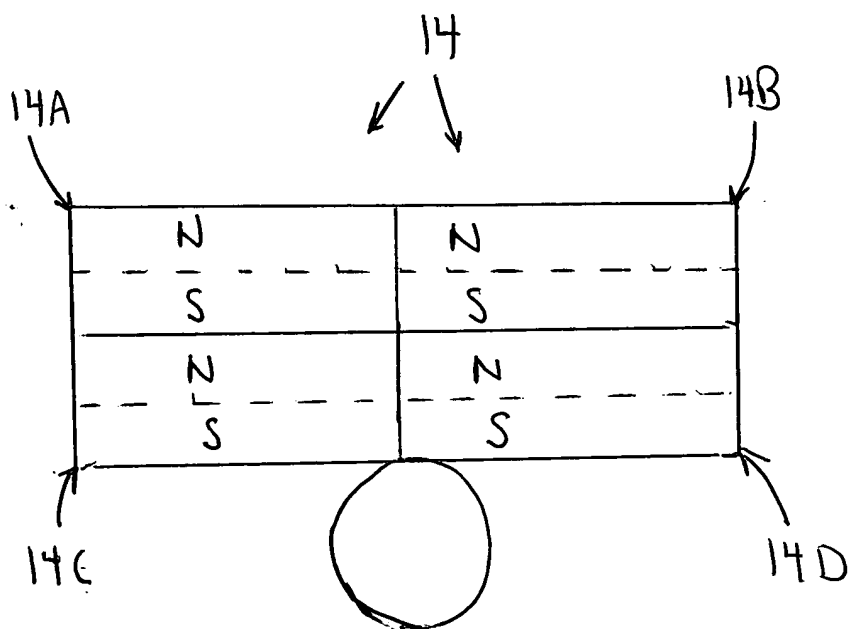
Appendix



Serial # 10/605,623

ZIGP: 102US

Appendix A



The *School for Champions* is an educational website that helps you become a champion and encourages you to help others.

School for Champions | Physical Science | Experiments | Senses | Good Grades
| List Your School

Explanation of magnetism to succeed in Physical Science. Also refer to physics, force, distance, magnetic field, electric charge, electron, magnet, ferromagnetism, iron, cobalt, nickel, Lorentz, attraction, repulsion, Ron Kurtus, School for Champions.
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Magnetism

by Ron Kurtus (revised 24 November 2004)

Magnetism is a force that acts at a distance and is caused by a magnetic field. This force strongly attracts ferromagnetic materials such as iron, nickel and cobalt. In magnets, the magnetic force strongly attracts an opposite pole of another magnet and repels a like pole. The magnetic field is both similar and different than an electric field.

Questions you may have include:

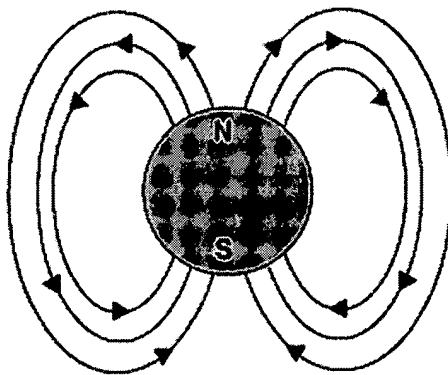
- What is a magnetic field?
- What is a magnetic force?
- How do magnetic and electric fields compare?

This lesson will answer those questions. There is a mini-quiz near the end of this lesson.

Magnetic field

A magnetic field consists of imaginary lines of flux coming from moving or spinning electrically charged particles. Examples include the spin of a proton and the motion of electrons through a wire in an electric circuit.

What a magnetic field actually consists of is somewhat of a mystery, but we do know it is a special property of space.



Magnetic field or lines of flux of a moving charged particle

Names of poles

The lines of magnetic flux flow from one end of the object to the other. By convention, we call one end of a magnetic object the N or North-seeking pole and the other the S or South-seeking pole, as related to the Earth's North and South magnetic poles. The magnetic flux is defined as moving from N to S.

Magnets

Although individual particles such as electrons can have magnetic fields, larger objects such as a piece of iron can also have a magnetic field, as a sum of the fields of its particles. If a larger object exhibits a sufficiently great magnetic field, it is called a magnet.

(See *Magnets* for more information.)

Magnetic force

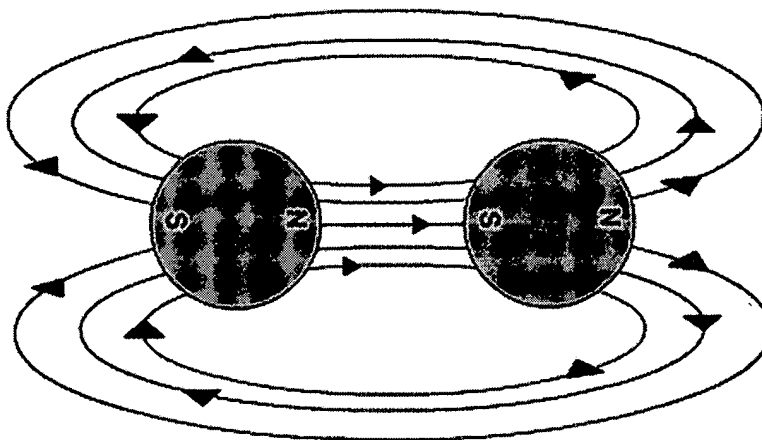
The magnetic field of an object can create a magnetic force on other objects with magnetic fields. That force is what we call magnetism.

When a magnetic field is applied to a moving electric charge, such as a moving proton or the electrical current in a wire, the force on the charge is called a Lorentz force.

(See *Magnetism and the Lorentz Force* for more information.)

Attraction

When two magnets or magnetic objects are close to each other, there is a force that attracts the poles together.



Force attracts N to S

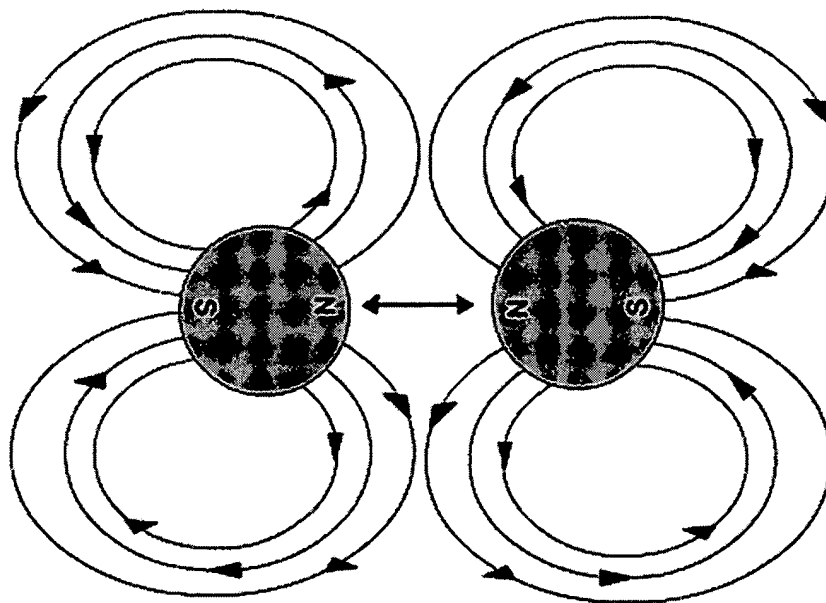
Magnets also strongly attract ferromagnetic materials such as iron, nickel and cobalt.

(See *Magnetic Materials* for more information.)

APPENDIX
B

Repulsion

When two magnetic objects have like poles facing each other, the magnetic force pushes them apart.



Force pushes magnetic objects apart

Magnets can also weakly repel diamagnetic materials. (See Magnetic Materials for more information.)

Magnetic and electric fields

The magnetic and electric fields are both similar and different. They are also inter-related.

Electric charges and magnetism similar

Just as the positive (+) and negative (-) electrical charges attract each other, the N and S poles of a magnet attract each other.

In electricity like charges repel, and in magnetism like poles repel.

Electric charges and magnetism different

The magnetic field is a dipole field. That means that every magnet must have two poles.

On the other hand, a positive (+) or negative (-) electrical charge can stand alone. Electrical charges are called monopoles, since they can exist without the opposite charge.

In conclusion